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# Cannabis Use and Disorder From Childhood to Adulthood in a Longitudinal Community Sample With American-Indians

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## Abstract

**Objective—**Recent changes in *DSM* criteria require new documentation of the prevalence and developmental sequences of cannabis use disorder. Our goal was to study the early course of *DSM-5* cannabis use disorder (CUD) and its overlap with *DSM-IV* and consumption constructs in a community-representative sample with American Indians.

**Method—**Data came from the prospective-longitudinal, population-based Great Smoky Mountains Study in North Carolina ($N$ = 1,420, including $n$ = 349 American Indians). Cannabis use and disorder were assessed during yearly interviews from ages 9 to 16, and again at ages 19, 21, 26, and 30 (up to 11 assessments per participant between 1993 and 2015).

**Results—**By age 30, approximately 70% of participants had used cannabis, 34% had used daily, and 18% had met criteria for *DSM-5* CUD. Approximately 1 in 4 cannabis users met criteria for CUD at some point. Those who met criteria initiated use over two years earlier (at age 13.3) compared to other users. Despite higher risks due to increased poverty, American Indians' patterns of use were similar to the rest of the sample. Concordance between *DSM-5* CUD and *DSM-IV* abuse/dependence was substantial, but was even higher between *DSM-5* CUD and daily use.

**Conclusion—**It was common to have either used cannabis daily or to have met criteria for *DSM-5* CUD by adulthood. *DSM-5* CUD was an improvement over *DSM-IV* diagnostic constructs by raising the threshold for diagnosis.

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This article is discussed in an editorial by Drs. Nancy Whitesell and Carol Kaufman on page xx.

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**Keywords**

American Indian; cannabis use; cannabis use disorder; epidemiology; adolescence

## INTRODUCTION

As efforts to legalize and decriminalize cannabis use are growing, cannabis involvement is increasingly viewed as harmless by youth (e.g., [1, 2]). At the same time, criteria for problematic cannabis use were changed with the 2013 transition to *DSM-5*, and critical pieces of information about cannabis disorder and use are currently missing. These include basic epidemiological documentation of *DSM-5* cannabis use disorder (CUD) prevalence and the overlap with *DSM-IV* diagnostic constructs and frequent-use measures up to age 30.

Several diagnostic changes were implemented with the transition to *DSM-5.* First, abuse and dependence were combined into a single CUD category. Second, a criterion related to cannabis-related legal problems was removed. This change may reduce racial/ethnic differences in areas in which there are disparities in legal or police contact. Third, a criterion related to craving/withdrawal was included. Finally, the threshold to diagnose was increased from ≥ 1 criterion to ≥ 2 criteria.[3, 4] This last change was implemented to address concerns that the threshold for *DSM-IV* abuse disorder was too low and potentially allowed for transient substance problems to be considered diagnostic. These changes in diagnostic criteria could impact the overall prevalence of CUD and also who (e.g., in terms of frequency of use) is likely to be diagnosed.

The aim of this analysis is to use a community-representative, longitudinal sample of children to study *DSM-5* CUD from ages 9 to 30. This includes looking at the point prevalence of cannabis use at different ages as well as assessing the cumulative prevalence of CUD by age 30. Next, we examine the overlap between *DSM-5* CUD with *DSM-IV* constructs and different frequency measures of cannabis use (e.g., weekly, daily). One goal is to understand whether the *DSM* changes accomplished what was intended; another is to determine how well frequency of cannabis use tracks *DSM-5* CUD for clinical diagnostic purposes.

American Indians are one of the most understudied segments of the population. The longitudinal course of substance use is rarely documented among American Indian youth; this gap in research exists, in part, because of a lack of long-term longitudinal studies among this group.[5,6] On average, substance use among American Indians begins earlier than among other races/ethnicities, involves heavier use, and increases more steeply.[7,8] Notably, considerable tribal and regional variation in use exists. With respect to cannabis use specifically, cross-sectional studies—primarily from the Western United States—reported that early marijuana use among American Indian youth was common.[9] In one tribe, >50% of youth had used marijuana by age 13.[9] Reasons cited for high cannabis use in this group include cultural/historical traditions, easier access to cannabis than to alcohol on some reservations,[9] and, importantly, demographic hardship— including poverty—endured by many American Indians (e.g., [9, 10]). The current study examines cannabis use and disorder

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among American Indian youth from the Cherokee Nation tribe in western North Carolina and local residents, who are primarily non-Hispanic whites.

In addition to race/ethnic differences, sex differences in cannabis use and disorder are known to exist in adolescence and young adulthood.[11–16] More information is needed about when such sex differences emerge, and whether sex differences take a similar developmental course in American Indian youth compared to other racial/ethnic groups.

## METHOD

### Participants

The Great Smoky Mountains Study (GSMS) is a prospective, longitudinal study of the development of psychiatric disorders and need for mental health services in rural and urban youth.[17–19] Three cohorts of children aged 9, 11, and 13 years at intake were recruited from 11 counties in western North Carolina in 1993. The GSMS design and sampling procedures are described elsewhere.[17,19] Briefly, a two-stage sampling design was employed, which oversampled for American Indians, who only make up 3% of the area population but 25% of the study sample. Accordingly, all participants were given a weight inversely proportional to their probability of selection to create a representative sample of western North Carolina. Of all participants recruited, 80% (N=1,420) agreed to participate. Of the 1,420 participants, 51.1% were female (unweighted n=630), 6.9% were non-Hispanic African-American (n=88), and 3.7% were American Indian (n=349). Throughout the results section, comparisons are made between the American Indian subsample and the other participants. The latter group was labeled “non-Indian” and consisted mainly of non-Hispanic whites and the small proportion of non-Hispanic African Americans.

Annual assessments were completed on the 1,420 children until age 16 and then again at ages 19, 21, 25, and 30 for a total of 11,084 assessments. The maximum possible number of interviews per participant is 8 (oldest cohort), 10 (middle cohort), and 11 (youngest cohort). The mean number of interviews to date is 7.7 (SD 2.3). Across all waves, 82.1% of all possible interviews were completed, ranging from 74% – 94% at any particular wave.

### Procedures

The parent (biological mother for 83% of interviews) and participant were interviewed by trained interviewers separately until the participant was 16; thereafter, only participants were interviewed. Before the interviews began, both the parent and child signed informed consent forms approved by the Duke University Medical Center Institutional Review Board. Each parent and child received an honorarium for their participation.

### Assessment

All variables were assessed using the Child and Adolescent Psychiatric Assessment (CAPA) until age 16, and its upward extension, the Young Adult Psychiatric Assessment (YAPA) thereafter.[20, 21] These structured interviews were coded by a trained interviewer, and each interview was subsequently checked by a supervisor. A detailed glossary provides the operational rules for each item assessed. In addition to the cannabis-related variables

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described below, the interview collected information on sex, race/ethnicity, and variables needed to calculate poverty status according to the federal guidelines for the year in which the assessment took place.

**Cannabis Involvement—**For the current analysis, the focus was on cannabis involvement, including *DSM-5* CUD, *DSM-IV* abuse, *DSM-IV* dependence, and non-diagnostic frequency measures for daily, weekly, or any cannabis use. The substance use module of the CAPA/YAPA assesses cannabis use, abuse, addiction, and disorder. The phenomenology of cannabis use was assessed via age-of-onset, frequency of use, symptoms of *DSM-IV* abuse and dependence, *DSM-5* CUD, and associated features of problematic use. These include: use of cannabis to improve mood, narrowed substance use repertoire, use first thing in the morning, blackouts, and cannabis-related criminality. Although *DSM-5* CUD symptoms of craving and withdrawal were not part of *DSM-IV* abuse or dependence diagnostic criteria, these data have been collected since the start of the GSMS study in 1993. The time frame for determining the presence of diagnostic items (both *DSM-IV* and *DSM-5*) was the three months immediately prior to the interview to minimize recall biases. Assessment of cannabis use and frequency of use included assessments of three-month primary periods for each interview, cumulatively across all interviews (i.e., across 8, 10, and 11 interviews for the oldest, middle, and youngest cohorts, respectively), and an ever/lifetime status.

The structure of the CAPA/YAPA substance use section consists of a preliminary section covering the use of specific substances, followed by a detailed section on symptoms and impairment, asked only if use is reported. Scoring algorithms written in SAS generate variables indicative of symptoms for *DSM-IV* abuse and dependence diagnoses and *DSM-5* CUD. In a two-week test retest study to determine the reliability of participant reporting, the intraclass correlation coefficient (ICC) for the number of substance abuse/dependence symptoms was .98.[22]

### Analytic Strategy

Sampling weights were applied to account for differential probability of selection and to ensure that the results represent unbiased estimates for the original population from which the sample was drawn. All reported prevalence estimates are weighted, and all sample sizes are unweighted. In addition, sandwich-type variance corrections[23] were applied to adjust for the parameter and variance effects induced by the sampling stratification. Weighted regression analyses were completed using PROC GENMOD in SAS 9.4.[24]

## RESULTS

### 3-Month Point Prevalence of Cannabis Involvement

Figures 1A–E show age-related patterns from ages 9 to 30 for 3-month cannabis-related disorders and daily, weekly, and any cannabis use for non-Indian and Indian females and males. These figures illustrate rapid increases from preadolescence to late adolescence, peaking at ages 19–21, and subsequent declines in the mid-20s that remain stable (i.e., slower declines or no change) to age 30. These age-related prevalence patterns were

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consistent with a cubic age effect for all frequency levels of cannabis involvement. The percentage of participants meeting *DSM-5* CUD criteria (Figure 1a) was similar to that of participants meeting either *DSM-IV* cannabis abuse or dependence disorders (Figure 1b) and slightly higher than that of participants reporting daily use in a three-month primary period (Figure 1c) from 9–30 years old.

An approximate 2-to-1 sex ratio was observed across all frequency levels of cannabis involvement during peak use periods at 19–21 years. For example, daily use (Figure 1c) peaked at approximately 10–15% for males and up to 5% for females. Weekly use (Figure 1d) peaked near 20% for males and just below 10% for females. Finally, any use in the past three months (Figure 1e) peaked at over 30% for males and over 15% for females. There was some evidence that the observed age-related patterns differed by sex and age by sex interactions in the trend range ($p<.10$). Among females only, the cubic age effect was significant ($p<.05$) for *DSM-5* CUD, *DSM-IV* abuse/dependence, weekly use, and any use, while daily use showed no age-related effect.

There were no consistent significant differences in overall levels or developmental trends of cannabis involvement by Indian/non-Indian status. Only at very specific ages did American Indians report slightly higher cannabis involvement (*ps* < .05). For instance, at age 19, American Indian males had the highest any use, weekly use, daily use, and *DSM-5* CUD, and at ages 13–14 American Indian females reported the most any use and *DSM-IV* cannabis abuse/dependence. In turn, at age 30, American Indian females had the lowest levels of involvement for weekly and any cannabis use.

### Cumulative Prevalence Across Childhood and Early Adulthood

Given the potentially harmful effects of cannabis exposure during the first few decades of life, an important public health question is just how many participants have reported cannabis involvement cumulatively—at some point from childhood to early adulthood. By age 30, 18% of study participants had met criteria for *DSM-5* CUD and 21% for *DSM-IV* cannabis abuse/dependence (Table 1). Males had higher cumulative prevalence estimates than females for both *DSM-IV* and *DSM-5* disorders. Race/ethnic differences in cumulative diagnostic prevalence estimates did not emerge. When the ever/lifetime variables were aggregated into cumulative lifetime prevalence variables, the data indicated that by age 30, one in three participants had used cannabis daily at some point; almost half had a period of weekly use; and over 7 in 10 participants had used cannabis (i.e., any use). Overlaying the cumulative ever/lifetime involvement data and cumulative diagnostic data suggested that 25% of participants who reported ever using cannabis met criteria for *DSM-5* CUD.

Males reported more frequent involvement than females across all use variables (e.g., daily, weekly) except any use. With respect to race/ethnic differences, American Indians reported more cumulative and ever/lifetime “daily use” and also more ever/lifetime “weekly use” but not cumulative “any use” or “ever weekly use.” Table S1, available online, provides cumulative prevalence estimates for all categories of cannabis involvement up to age 16 when high levels of involvement were much less common.

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### Ages-of-Onset

Median ages-of-onset were derived from the ever/lifetime variables (except for *DSM* diagnoses, which were assessed using the three-month time frame only). The median age-of-onset for cannabis-related disorders was around age 19 (Table 2; Figure S1, available online). For the non-diagnostic use variables, at least one in four users initiated use by age 16 or earlier according to interquartile ranges. Significant sex differences existed for both the diagnostic and non-diagnostic variables, with males typically displaying earlier onsets than females. Race/ethnic differences did not emerge for the diagnostic age-of-onset data, but they did emerge for all frequency of use data, with American Indians typically initiating use at earlier ages than non- Indians (noted higher cumulative rates by age 16 in Table S1, available online).

Age-of-onset data was also used to understand progression to high-frequency use. These analyses revealed that those who met criteria for *DSM-5* CUD initiated cannabis use earlier than those who never met full CUD criteria (median of 13.3 vs. 15.5 years, $p < .001$). Similarly, youth who reported daily use at some point by age 30 had a significantly younger age-of-onset of cannabis use compared to their peers who reported any use but never daily use (median of 14.0 vs. 16.3 years, $p < .001$).

### *DSM-5* and *DSM-IV* Overlap

Figure 2a shows the levels of co-occurrence for participants who met criteria for either *DSM-5* CUD or *DSM-IV* cannabis disorder (abuse or dependence) at any given assessment and also cumulatively by age 30. The overlap was high and statistically significant (any given assessment: OR=52.0, 95% CI, 34.9–77.6, $p < .001$ or $\kappa = 0.49$; cumulatively: OR=19.2, 95% CI, 11.0–44.6, $p < .001$ or $\kappa = 0.55$). At any given wave, nearly half of the participants who met criteria for a cannabis disorder according to one of the *DSM* diagnostic guidelines failed to meet criteria for the other. Figure 2b shows the overlap between specific *DSM-IV* disorders and *DSM- 5* CUD at any given wave. Overall, approximately a third of participants met criteria for a diagnosis of *DSM-IV* abuse/dependence, *DSM-5* CUD, or both. The high overlap was primarily due to *DSM-IV* abuse, as there were no cases of *DSM-IV* dependence that failed to meet criteria for *DSM-5* CUD. This raises the question of who is meeting criteria for *DSM-5* CUD but did not meet criteria for either *DSM-IV* disorder. Participants meeting criteria for *DSM-5* CUD only reported no *DSM-IV* abuse symptoms (by definition) but did report a mean of 1.7 dependence symptoms (SD=0.54). (This compared to a mean of 2.1 symptoms [SD=0.87] for cases that overlapped.) Thus, in this sample, *DSM-5* CUD identified subthreshold *DSM-IV* dependence cases with no abuse symptoms. These cases, also known as diagnostic orphans, were previously undiagnosed.

### *DSM-5* Cannabis Use Disorder and Frequent Cannabis Use

Finally, we examined overlap between *DSM-5* CUD and frequent (i.e., daily) cannabis use. Figure 3a shows the levels of co-occurrence for those reporting either daily cannabis use or CUD at any given assessment and also cumulatively by age 30. The overlap was much greater than expected by chance (any given assessment: OR=151.0, 95% CI, 91.1–250.4, $p < .001$ or $\kappa = 0.64$; cumulatively: OR=95.3, 95% CI, 46.3–195.7, $p < .001$ or $\kappa = 0.73$). While *DSM-5* CUD without daily use occurred some of the time, daily cannabis use without also

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meeting criteria for CUD was very rare. Figure 3b shows the cumulative overlap by the number of individual assessments at which an individual met criteria for CUD or reported daily cannabis use. As expected, the more often an individual reported daily use, the more likely s/he was to also report *DSM-5* CUD and vice versa. A comparison of those who met criteria for *DSM-5* CUD but never reported using cannabis daily with those who reported CUD and daily use showed significant differences on 2 of the 11 symptoms of CUD: time spent obtaining/using/recovering and craving. Individuals who reported daily use and met CUD diagnosis had significantly higher endorsement levels for both symptoms than those with CUD only (time spent: 96.4% vs. 61.6%, p <.001; craving: 70.2% vs. 11.6%, p <.001).

## DISCUSSION

Using the GSMS sample to assess participants from 9–30 years of age, we observed that levels of cannabis involvement were constantly changing, with steep increases across adolescence to a peak in early adulthood followed by decreases and subsequent plateaus to the early 30s. The findings are consistent with previous cross-sectional and shorter-term longitudinal studies of cannabis use.[25–27] By age 30, approximately 70% of all participants had used cannabis at some point, over 30% had used cannabis daily, and 18% had met criteria for *DSM-5* CUD based on cumulative prevalence estimates. This cumulative prevalence was higher than the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) III total lifetime estimate of 6.3% on average and 11% for ages 18–29.[28] NESARC's lower estimate is likely due to the cross-sectional, single-wave design with retrospective lifetime reports. Such designs tend to significantly underestimate the prevalence of mental health and substance disorders (e.g.,[29,30])

Moreover, the observed GSMS cumulative prevalence estimate of *DSM-5* CUD by age 30 is likely to be an underestimate, too. Our study assessed CUD in the 3 months immediately preceding each interview. Consequently, the assessments covered at most approximately two years and 9 months (11 assessments × 3 months) of our participants' lives spanning a 21-year period. In addition, cannabis use had not been decriminalized or legalized in North Carolina during the study period, which may have resulted in under-reporting. Thus, the "true" prevalence of *DSM-5* CUD by age 30 likely exceeds the observed 20%. This projection is also supported by our cumulative ever/lifetime variables for use that found that 1 in 4 individuals who had ever used cannabis by age 30 (70% of sample) also met criteria for *DSM-5* CUD.

### *DSM-5* Comparison to *DSM-IV* and Frequency of Use Measures

Consistent with previous studies conducted among adults, the prevalence of CUD did not change dramatically when comparing *DSM-5* and *DSM-IV* diagnoses.[31, 32] The overlap in cases was substantial but not complete, below 50% at any given assessment. Inconsistencies in diagnoses were attributable to the addition of criteria in *DSM-5* but also to the new minimum diagnostic threshold that falls between that of *DSM-IV* abuse and dependence. Consequently, only a subset of participants with *DSM-5* CUD would meet full criteria for *DSM-IV* dependence. And, many participants with *DSM-IV* abuse would fail to meet minimum criteria for *DSM-5* CUD. Importantly, the new *DSM-5* CUD criteria cover *DSM-*

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*IV* diagnostic orphans, participants who were subthreshold for dependence but did not display abuse symptoms.[32] As such, the changes to the *DSM* appear to have met the intended goals of raising the minimum threshold for having a cannabis disorder and covering prior diagnostic orphans.

At the same time, it is noteworthy that the overlap of *DSM-5* was greater with a simple measure of daily cannabis use than with the *DSM-IV* constructs. Combined with prior findings, this study supports inclusion of frequency of use measures to future *DSM* criteria for CUD.[33] Finally, additional work must be done on how this revised *DSM* construct relates to other psychiatric disorders over time (i.e., which disorders or comorbidities best predict *DSM-5* CUD and vice versa).

### Sex and Race Differences in Cannabis Involvement

Our findings suggest that overall levels of cannabis use and disorder were higher in males than in females, as has been shown in other studies.[12,14–16] It is important to note, however, that the overall age-related pattern of steep increases in adolescence, peaks in young adulthood, and decreases/plateaus to age 30 did not differ by sex, suggesting similar developmental patterns despite underlying sex differences in overall levels.

There were no consistent race/ethnic differences in the point prevalence of 3-month use, *DSM* disorders, or the overall age-related trends in cannabis use. (The exceptions, Indian females in early adolescence and Indian males at age 19, were observed early in development.) The lack of race/ethnic differences is noteworthy because American Indians were exposed to substantially higher rates of poverty in our sample, and this risk factor is typically linked to substance use and disorders.[5, 6] Resilience in our American Indian study population has been reported previously (to ages 19 and 21) and is, in part, attributable to income supplements received by American Indian families and their community following casino openings in the late 1990s.[34] These findings are also consistent with correlational studies reporting that differences in substance use between American Indian and white participants are no longer significant when adjusting for annual family income and education level (and also sex, age, urbanicity, and region).[26] There may be additional explanations for the late adolescent declines in use. Whitebeck et al. reported similar declines in late adolescents' substance use in an indigenous sample that did not experience an income shock.[35] As in their study, it is possible that cultural changes to promote greater resilience within the tribe could have contributed to the decline in cannabis use in late adolescence.

However, by age 30, our study identified higher cumulative ever/lifetime estimates in weekly and daily use among American Indians. These differences were likely due to an earlier age-of-onset of cannabis use among American Indian youth compared to their non-Indian neighbors. For example, by age 16, 38% of American Indian females and 28% of American Indian males had reported lifetime use compared to 15% and 23% of non-Indian females and males, respectively. High prevalence and "reverse" sex differences in early cannabis use would be consistent with previous work on American Indians.[36, 37] Early onset and frequent use often predict subsequent problematic use,[38] thus our lack of race/ethnic differences in 3-month use and CUD across ages is especially notable. Previous studies have reported faster increases in cannabis use among American Indians, which we did not find.[7, 8] The

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geographic integration and social, educational, and economic opportunities available to American Indian adolescents in our study could have shielded them from an escalation of use.

The prospective, longitudinal cohort design is both a strength and a weakness. On the one hand, this design allowed us to examine age-related changes in the prevalence of cannabis disorder and frequency of use in the same group of individuals over time. On the other hand, policies and attitudes toward cannabis use have changed dramatically from 1993 to 2015, as did the chemical composition of cannabis products used across this period. Consequently, the age- related changes observed here may not generalize to other historical times, cohorts, and places. Nevertheless, our overall prevalence estimates (e.g., of *DSM-IV* diagnostic constructs) were remarkably similar to those from other studies from around the globe. In addition, the sample is only representative of the community from which it was drawn. Consequently, it is not representative of the US population in that American Indians are overrepresented and African Americans and Latinos underrepresented. It is also important to note that the Indian tribe studied here is distinctive in terms of its history and economics and social circumstances, and our findings are not meant to be representative of other tribes. Nevertheless, heterogeneity among Indian tribes should not be a barrier to research on this disadvantaged group, and our findings may inform expectations for other groups with similar characteristics.

This analysis has implications for a research agenda for *DSM-5* CUD. First, given that close to 1 in 5 individuals met criteria for this disorder by age 30 and 1 in 3 reported daily use, it is imperative for additional work to test causal links between early life course cannabis involvement and later morbidities. This would prioritize longitudinal studies with detailed baseline data (particularly health measures) and adequate controls (e.g., sibling analysis, twin designs) as well as natural experiments that capitalize on the differences in legal restrictions regarding cannabis use across states and countries. Second, our age-related findings suggest that a joint consideration of late adolescence (as the period of highest first use) and the late 20s (as a key period of potential desistance from use) should be a priority for cannabis use researchers. A shift to analyses of developmental trajectories of age-at-initiation, duration of use, and desistance from use could be especially beneficial to understand precursors, correlates, and outcomes. Future studies of early risk factors for cannabis involvement should take into account these developmental findings to better understand what predicts cannabis use that persists into adulthood.

Our findings suggest that *DSM-5* CUD is an improvement over *DSM-IV* diagnostic constructs by both raising the threshold for diagnosis and including important additional criteria while also eliminating some *DSM-IV* diagnostic orphans. Our findings also indicate that a simple heuristic for clinicians to assess risk for *DSM-5* CUD is to ask about frequency of use. If daily use is reported, then *DSM-5* CUD is likely.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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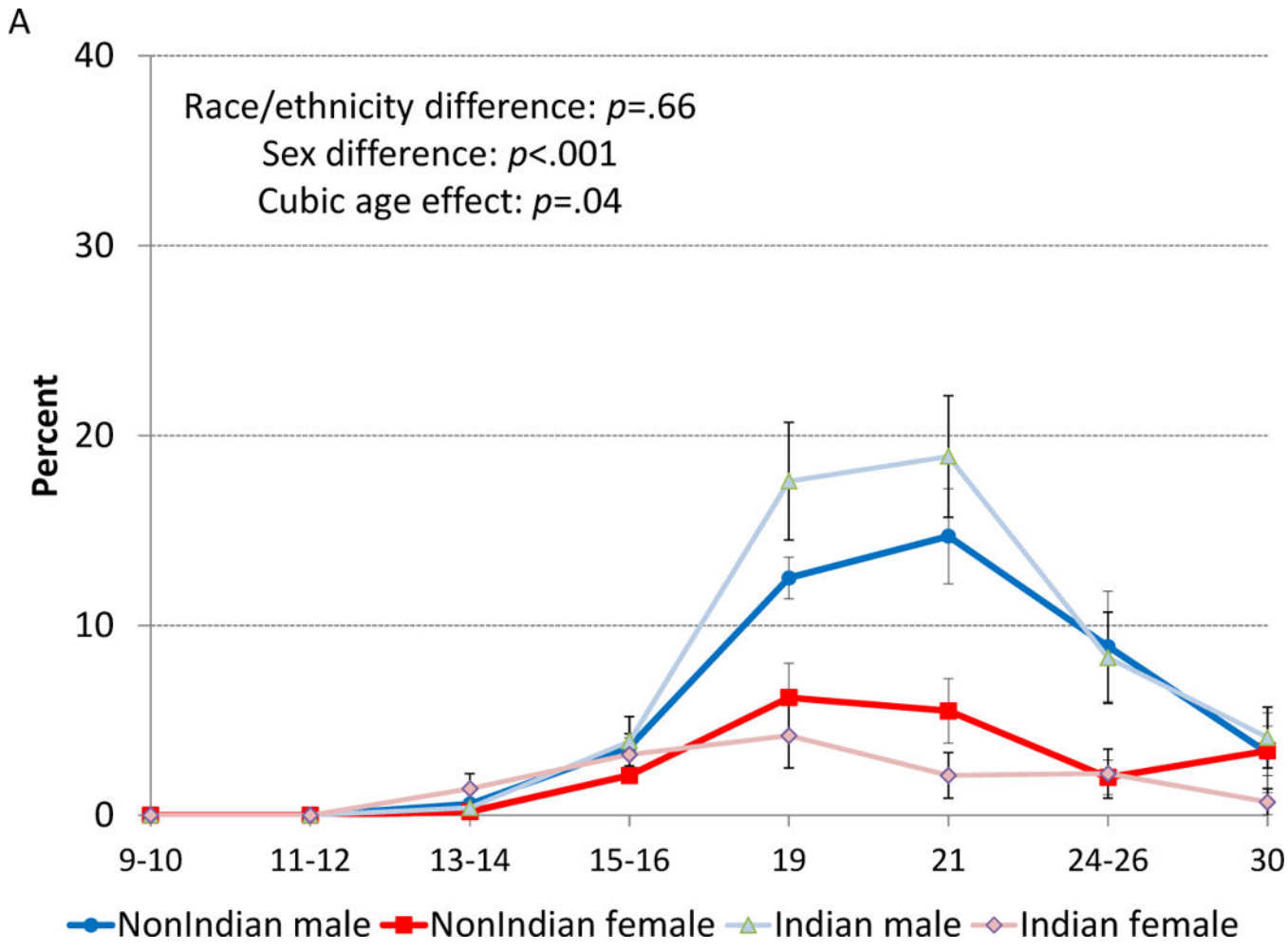

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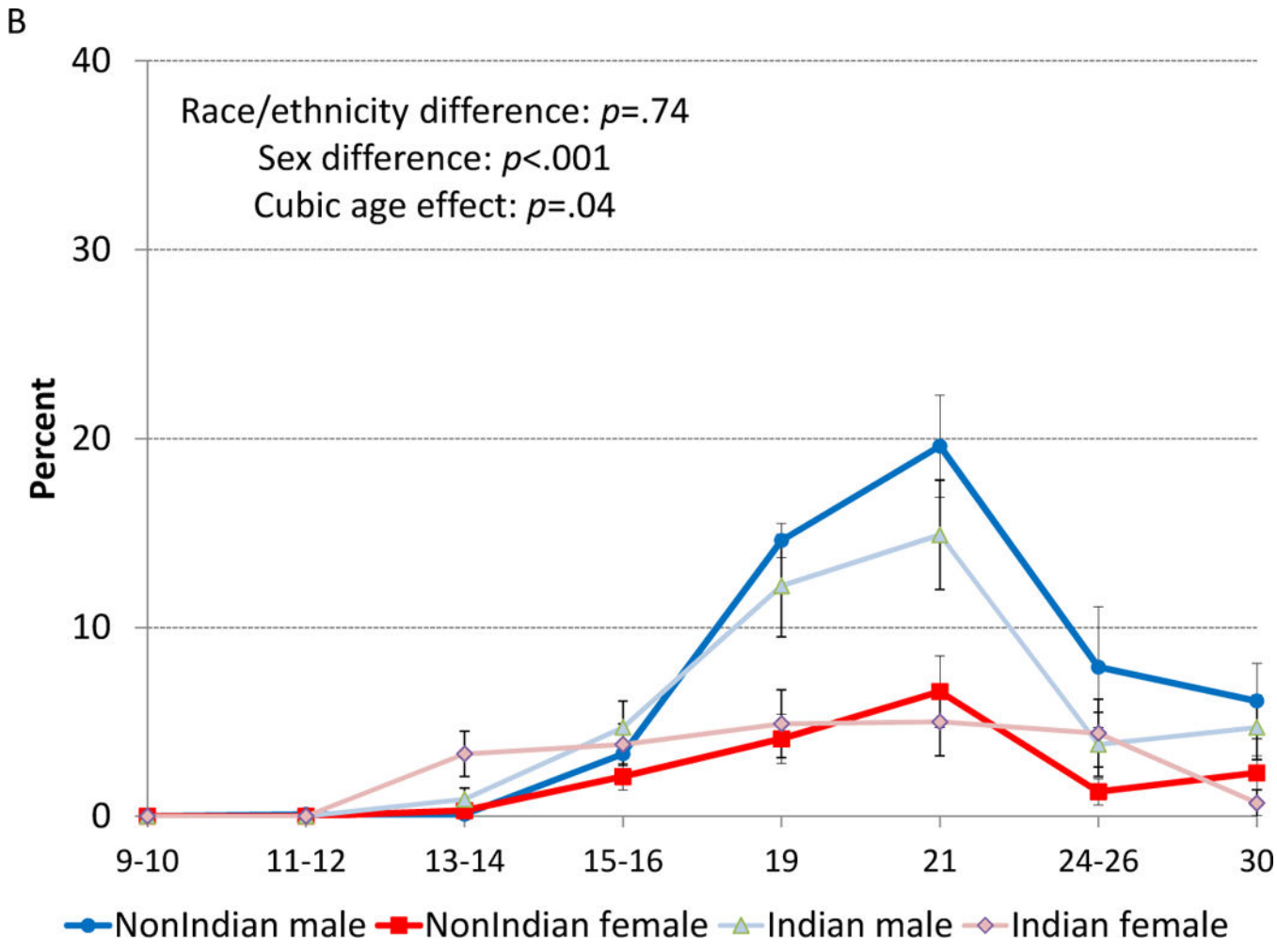

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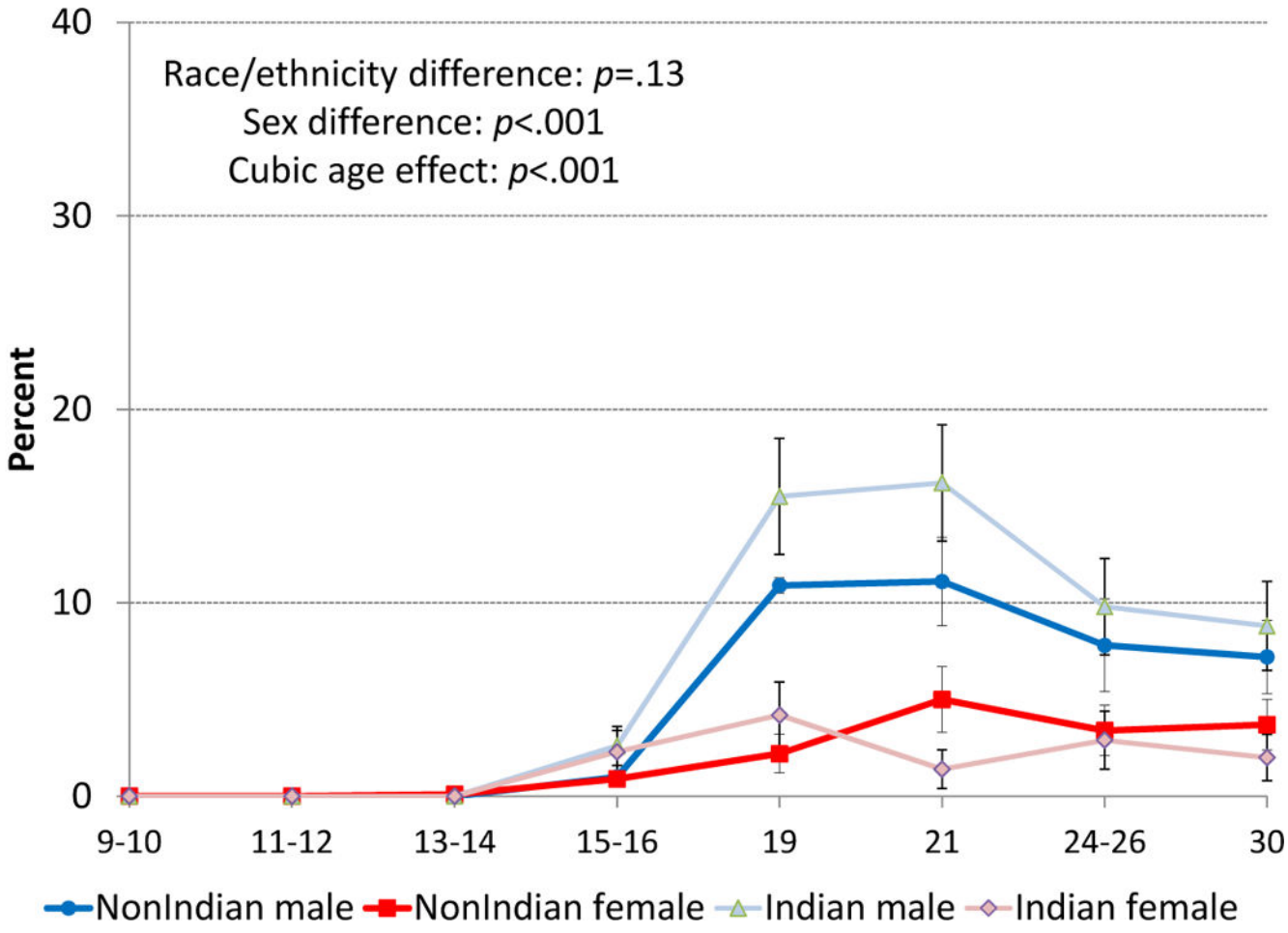

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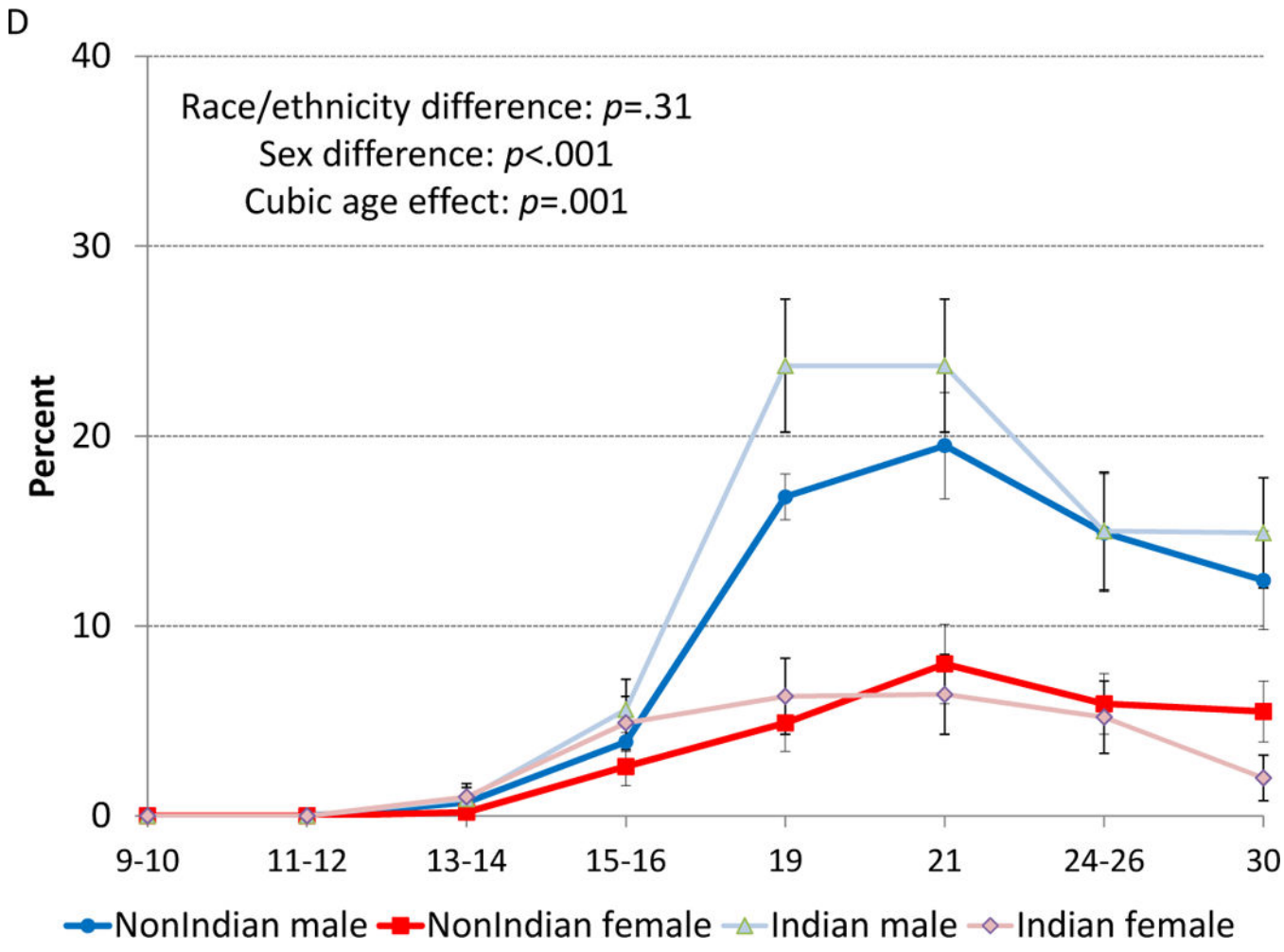

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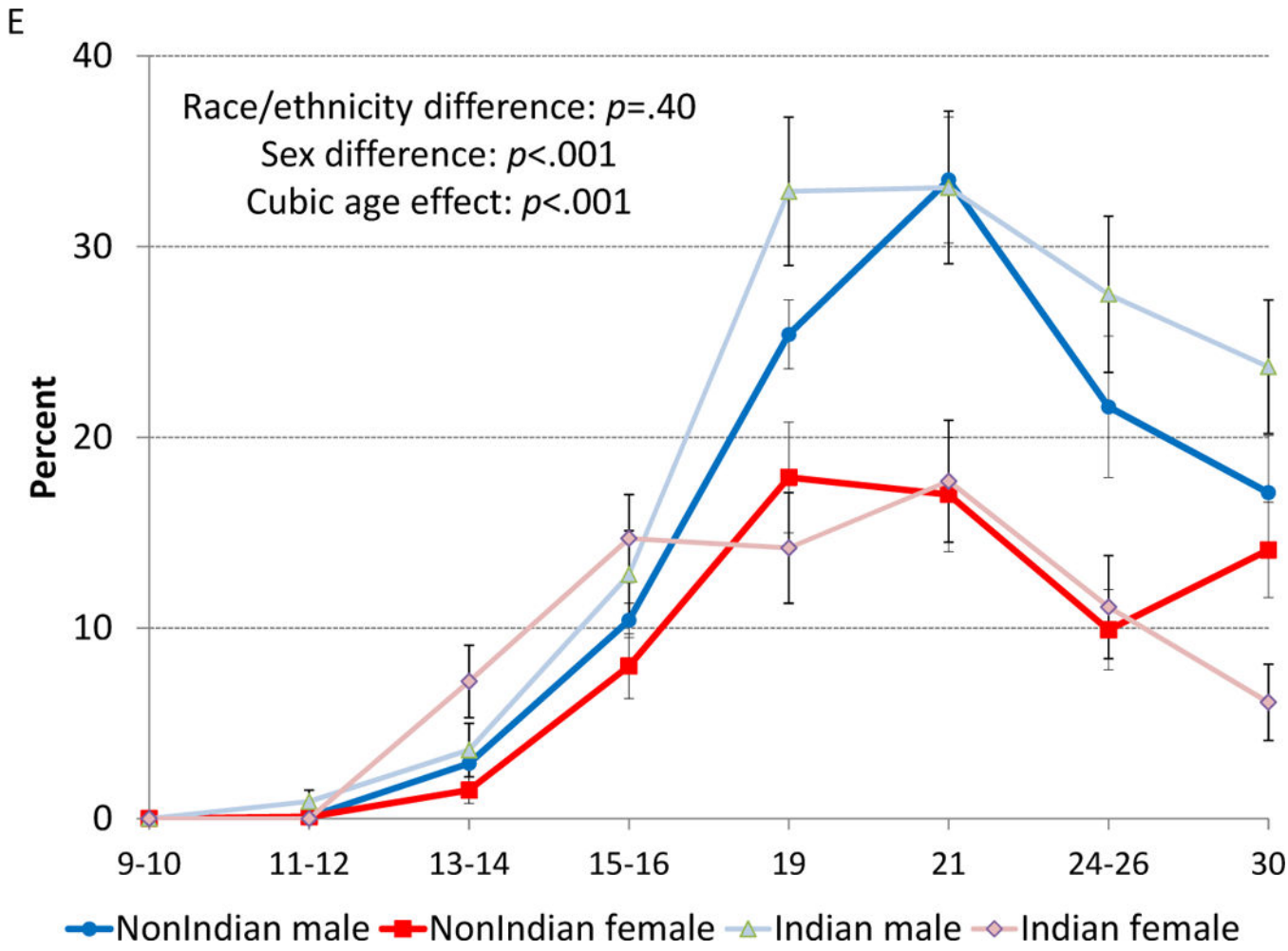


**Figure 1.**

Three-month prevalence estimates for a) *DSM-5* cannabis use disorder (CUD), b) *DSM-IV* abuse or dependence, c) daily cannabis use, d) weekly cannabis use, and e) any cannabis use from ages 9 to 30 by sex and Indian/non-Indian status.

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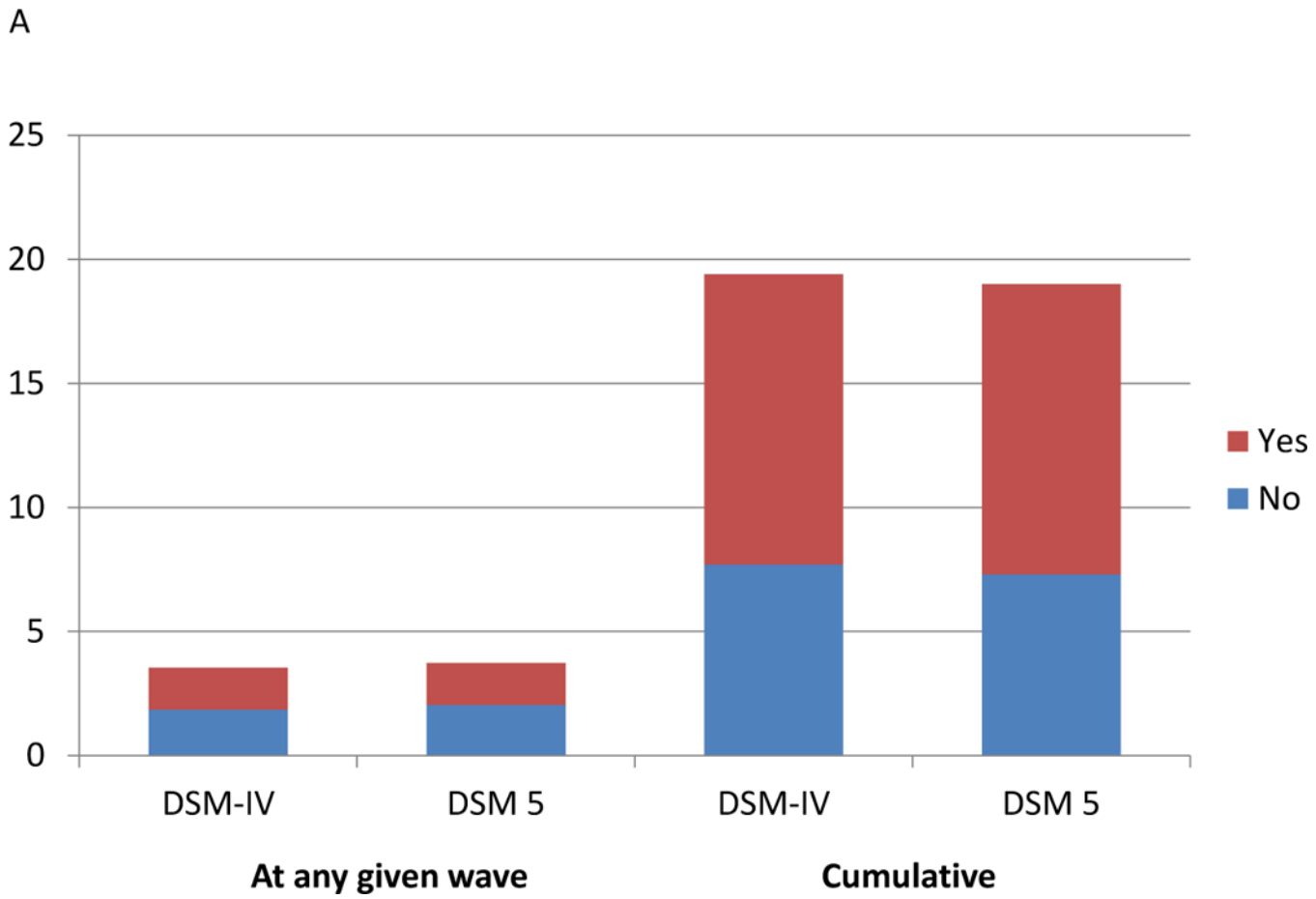

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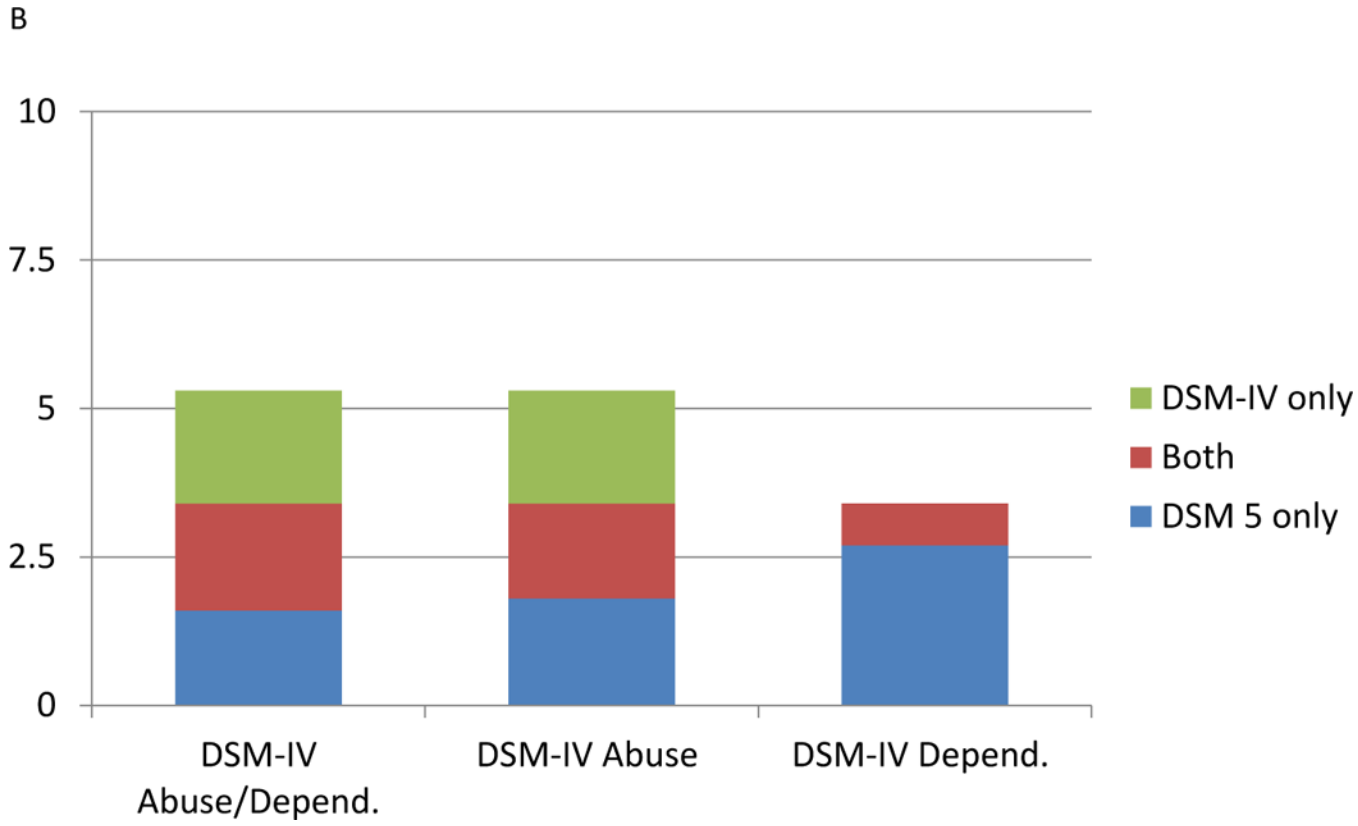


**Figure 2.**

Co-occurrence of *DSM-5* cannabis disorder a) with *DSM-IV* status at any given assessment and cumulatively and b) with specific *DSM-IV* cannabis disorder at a given assessment.

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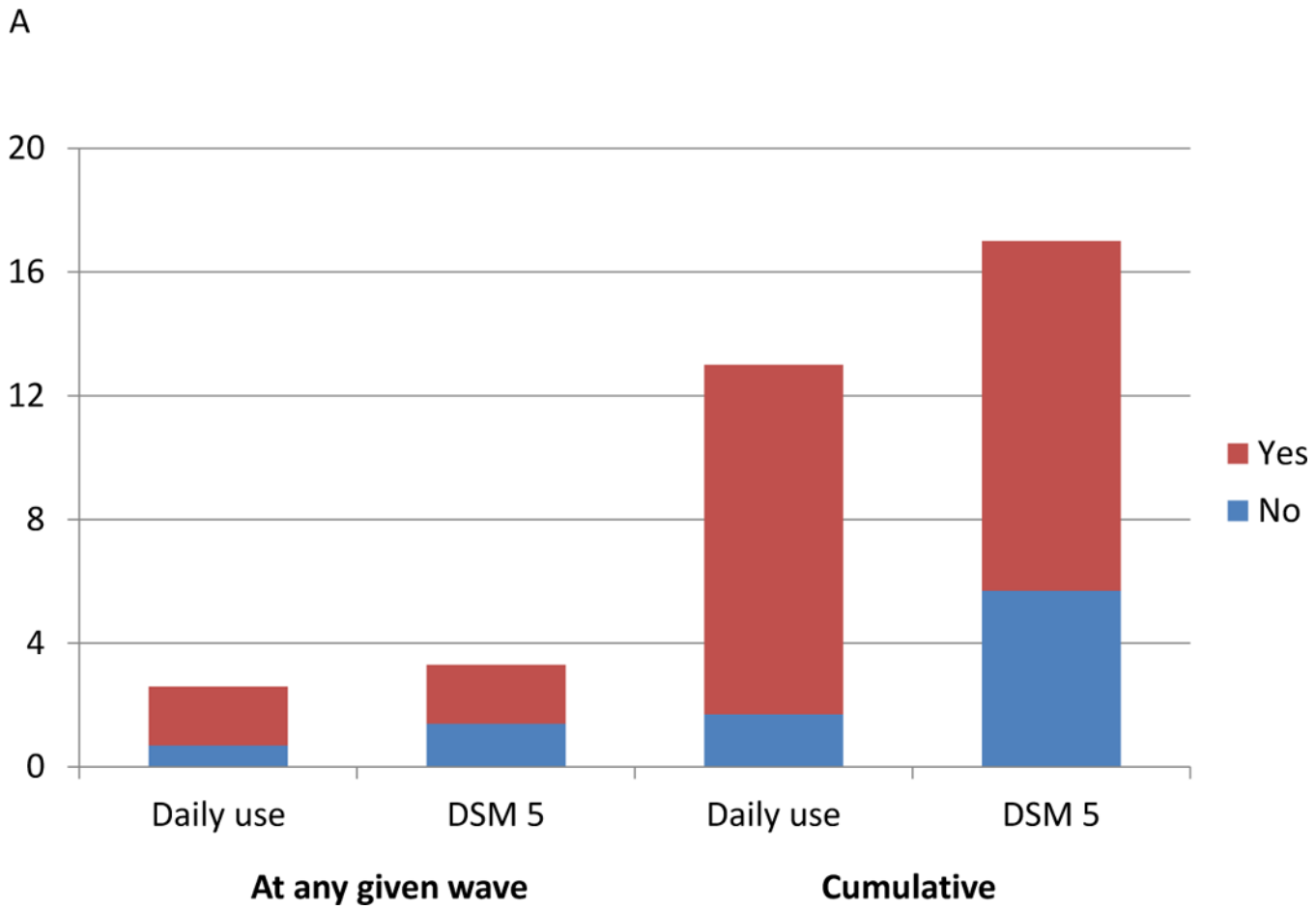

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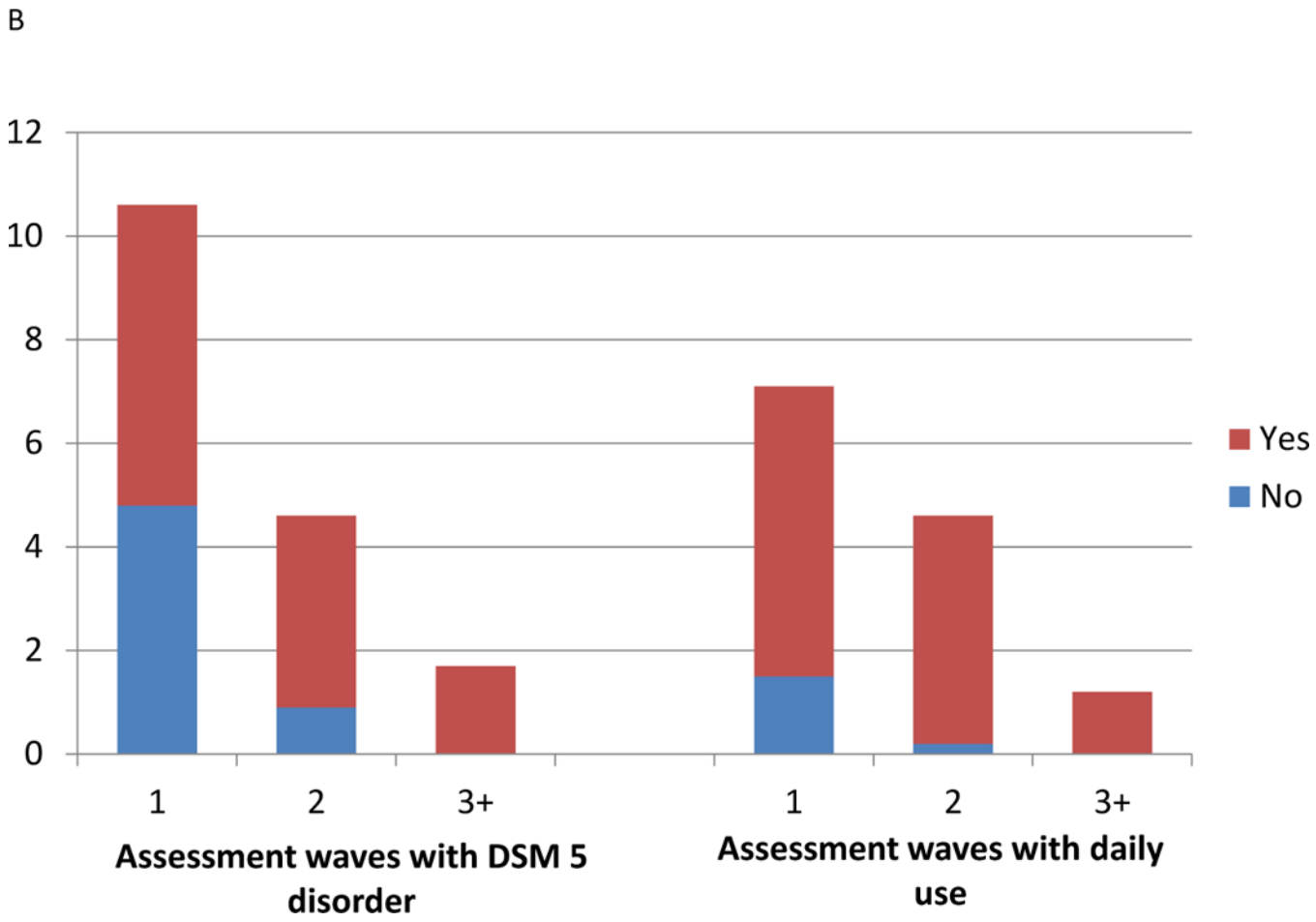


**Figure 3.**

Co-occurrence of *DSM-5* cannabis use disorder a) and daily cannabis use at any given assessment and cumulatively and b) with daily cannabis use cumulatively by the number of assessments with reported disorder or daily use.

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**Table 1**

Cumulative Prevalence Estimates of Cannabis Disorder and Frequency of Use by Age 30

| | Overall | Non-Indians | | Indians | | Sex Differences | Race/Ethnicity Differences |
|---|---|---|---|---|---|---|---|
| | | Female | Male | Female | Male | | |
| **Total** | **N=1,420** | **n=464** | **n=607** | **n=166** | **n=183** | | |
| | **% *(n)*** | **% *(n)*** | **% *(n)*** | **% *(n)*** | **% *(n)*** | ***p*** | ***p*** |
| **Cumulative Diagnoses – 3-Month Timeframe** | | | | | | | |
| 3-month *DSM-5* CUD | 17.9 (269) | 12.3 (60) | 23.2 (138) | 11.5 (19) | 28.4 (52) | .002 | .39 |
| 3-month *DSM-IV* abuse/dependence | 20.5 (290) | 12.1 (66) | 28.5 (150) | 16.3 (27) | 25.7 (47) | <.001 | .86 |
| **Cumulative Use – Ever Time Frame** | | | | | | | |
| Ever daily use | 34.4 (548) | 23.8 (119) | 43.9 (277) | 35.5 (59) | 50.8 (93) | **<.001** | **.006** |
| Ever weekly use | 47.9 (714) | 40.3 (184) | 54.6 (337) | 45.2 (75) | 64.5 (118) | **.001** | **.03** |
| Ever any use | 71.5 (1038) | 68.7 (327) | 73.8 (442) | 75.9 (126) | 78.1 (143) | .22 | .07 |

Note: Bolded values are significant at $p < .05$. CUD = cannabis use disorder.

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**Table 2**

Age-of-Onsets for Cannabis Disorder and Use Among Young People Who Have Ever Used Cannabis

| | Overall | Non-Indians | | Indians | | Sex Differences | Race/Ethnicity Differences |
|---|---|---|---|---|---|---|---|
| | | Female | Male | Female | Male | | |
| | ***M (IQR)*** | ***M (IQR)*** | ***M (IQR)*** | ***M (IQR)*** | ***M (IQR)*** | ***p*** | ***p*** |
| *DSM-5* CUD | 19.3 (18.9–21.3) | 19.0 (16.1–21.4) | 19.5 (18.9–21.3) | 19.1 (15.1–20.9) | 19.4 (19.0–21.6) | **.001** | .37 |
| *DSM-IV* abuse or dependence | 19.6 (18.9–21.6) | 19.2 (16.1–21.3) | 20.1 (18.9–21.7) | 16.1 (14.6–20.8) | 19.8 (16.9–21.5) | **<.001** | .79 |
| Daily use | 16.6 (15.5–18.8) | 16.5 (15.5–19.5) | 16.6 (15.5–18.6) | 17.0 (15.5–18.6) | 16.0 (15.0–18.0) | **<.001** | **.003** |
| Weekly use | 16.1 (14.5–18.0) | 16.5 (15.0–18.0) | 16.0 (14.5–17.6) | 16.0 (14.5–18.0) | 15.5 (14.0–18.0) | **<.001** | **.02** |
| Any use | 15.0 (13.3–17.0) | 15.5 (13.9–17.5) | 14.6 (12.5–16.4) | 14.9 (13.0–16.4) | 14.0 (12.0–16.0) | **.02** | **.009** |

Note: Bolded values are significant at $p < .05$. CUD = cannabis use disorder; IQR = interquartile range difference between the $25^{th}$ and $75^{th}$ quartiles.